Release notes for ENDF/B Development n-081_Tl_205 evaluation

April 26, 2017

- `psyche` Warnings:

1. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 0 / AT RESONANCE ENERGY 5.09800E+03 EV. THE GAMMA WIDTH 3.87000E-01 DEVIATES TOO MUCH FROM THE AVERAGE 1.64283E+00 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  0
                AT RESONANCE ENERGY  5.09800E+03 EV. THE GAMMA WIDTH  3.87000E-01 DEVIATES TOO MUCH FROM THE AV
```

2. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 0 / AT RESONANCE ENERGY 2.40400E+04 EV. THE GAMMA WIDTH 9.15131E-02 DEVIATES TOO MUCH FROM THE AVERAGE 1.64283E+00 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  0
                AT RESONANCE ENERGY  2.40400E+04 EV. THE GAMMA WIDTH  9.15131E-02 DEVIATES TOO MUCH FROM THE AV
```

3. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 0 / AT RESONANCE ENERGY 5.42500E+04 EV. THE GAMMA WIDTH 9.50000E+00 DEVIATES TOO MUCH FROM THE AVERAGE 1.64283E+00 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  0
                AT RESONANCE ENERGY  5.42500E+04 EV. THE GAMMA WIDTH  9.50000E+00 DEVIATES TOO MUCH FROM THE AV
```

4. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 0 / AT RESONANCE ENERGY 7.87800E+04 EV. THE GAMMA WIDTH 3.03297E-01 DEVIATES TOO MUCH FROM THE AVERAGE 1.64283E+00 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  0
                AT RESONANCE ENERGY  7.87800E+04 EV. THE GAMMA WIDTH  3.03297E-01 DEVIATES TOO MUCH FROM THE AV
```

5. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE ENERGY 1.01820E+04 EV. THE GAMMA WIDTH 1.80000E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  1.01820E+04 EV. THE GAMMA WIDTH  1.80000E-02 DEVIATES TOO MUCH FROM THE AV
```

6. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE ENERGY 1.17570E+04 EV. THE GAMMA WIDTH 1.06000E-01 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  1.17570E+04 EV. THE GAMMA WIDTH  1.06000E-01 DEVIATES TOO MUCH FROM THE AV
```

7. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE ENERGY 2.10790E+04 EV. THE GAMMA WIDTH 3.56694E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  2.10790E+04 EV. THE GAMMA WIDTH  3.56694E-02 DEVIATES TOO MUCH FROM THE AV
```

8. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE ENERGY 2.35740E+04 EV. THE GAMMA WIDTH 1.45859E+00 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  2.35740E+04 EV. THE GAMMA WIDTH  1.45859E+00 DEVIATES TOO MUCH FROM THE AV
```

9. Gamma width not in agreement with PSYCHE's expectations
   FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE ENERGY 2.67670E+04 EV. THE GAMMA WIDTH 9.25189E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  2.67670E+04 EV. THE GAMMA WIDTH  9.25189E-02 DEVIATES TOO MUCH FROM THE AV
```

10. Gamma width not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE ENERGY 3.44320E+04 EV. THE GAMMA WIDTH 4.73524E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  3.44320E+04 EV. THE GAMMA WIDTH  4.73524E-02 DEVIATES TOO MUCH FROM THE AV
```

11. Gamma width not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE ENERGY 4.49190E+04 EV. THE GAMMA WIDTH 3.06665E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  4.49190E+04 EV. THE GAMMA WIDTH  3.06665E-02 DEVIATES TOO MUCH FROM THE AV
```

12. Gamma width not in agreement with PSYCHE's expectations
    FILE 2 / SECTION 151 / ISOTOPE MASS = 205. L = 1 / AT RESONANCE

ENERGY 4.93900E+04 EV. THE GAMMA WIDTH 4.80000E-02 DEVIATES TOO MUCH FROM THE AVERAGE 3.64477E-01 (0): Gamma width

```
FILE  2
   SECTION 151
        ISOTOPE MASS = 205. L =  1
                AT RESONANCE ENERGY  4.93900E+04 EV. THE GAMMA WIDTH  4.80000E-02 DEVIATES TOO MUCH FROM THE AV
```

13. Strength function in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ENERGY = 8.36650E+04. STRENGTH FUNCTION IS 7.80000E-05 / STRENGTH FUNCTION 7.80000E-05 / LIES OUTSIDE LIMITS 1.00000E-04 TO 6.00000E-04 (0): URR str. ftn.

```
FILE  2
   SECTION 151
         ENERGY =  8.36650E+04. STRENGTH FUNCTION IS  7.80000E-05
                       STRENGTH FUNCTION 7.80000E-05
                                          LIES OUTSIDE LIMITS 1.00000E-04 TO 6.00000E-04
... [61 more lines]
```

- `recent` Warnings:

1. Statistical weight of certain L values were incorrect
0: RRR goof (a)

```
 Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
 ============================================================================
 Retrieval Criteria-----------        MAT
 File 2 Mimimum Cross Section- 1.0000E-10 (Standard Option)
 Reactions with No Background-     Output (Resonance Contribution)
... [511 more lines]
```

- `fudge-4.0` Warnings:

1. Potential scattering hasn't converted, you need more L's!
resonances / resolved (Error # 1): potentialScatteringNotConverged

```
WARNING: Potential scattering hasn't converged by L=1 at E=83665.0 eV, xs[1]/xs[0]=0.562915011248% > 0.1%
```

2. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.64%
```

3. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 3.84%
```

- `fudge-4.0` Errors:

1. The spin statistical weights are off, indicating missing channels
resonances / resolved / MultiLevel_BreitWigner (Error # 0): badSpinStatisticalWeights

```
WARNING: The spin statical weights for L=1 sums to 2.25, but should sum to 3.0.  You have too few channels for r
```

2. Calculated and tabulated Q values disagree.
   reaction label 41: n[multiplicity:'2'] + Tl204 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -7169011.572967529 eV vs -7.546e6 eV!
```

3. Calculated and tabulated Q values disagree.
   reaction label 42: n[multiplicity:'3'] + Tl203 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -13825108.2338562 eV vs -1.4202e7 eV!
```

4. Calculated and tabulated Q values disagree.
   reaction label 43: n[multiplicity:'4'] + Tl202 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -21674346.30459595 eV vs -2.2051e7 eV!
```

5. Calculated and tabulated Q values disagree.
   reaction label 44: Tl206 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 6880744.324157715 eV vs 6.503e6 eV!
```

- `njoy2012` Warnings:

1. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (0): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 16 does not give recoil za= 81204
                          one-particle recoil approx. used.
```

2. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (1): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 17 does not give recoil za= 81203
                          one-particle recoil approx. used.
```

3. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (2): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 37 does not give recoil za= 81202
                          one-particle recoil approx. used.
```

4. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (3): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 91 does not give recoil za= 81205
                          one-particle recoil approx. used.
```

5. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (4): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt102 does not give recoil za= 81206
                          photon momentum recoil used.
```

- `acelst` Warnings:

1. The incident energy grid is not monotonic for this angular distribution
   0: Bad Ang. Dist.

```
 ACELST WARNING - Processing Ang.Dist.MT         2
                  E-grid non-monotonic   1.700000000E+01 1.700000000E+01
```

- `endf2htm` Warnings:

  1. Build of a section of the HTML page failed because the format hasn't been implemented in ENDF2HTM.
     MF32MT151: Unimplemented

     ```
     At line 2659 of file endf.f
     Fortran runtime error: Bad value during integer read
     ```